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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/562,528	12/28/2005	Xue-Jan Fan	US030215	7980

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PHILIPS INTELLECTUAL PROPERTY & STANDARDS
P.O. BOX 3001
BRIARCLIFF MANOR, NY 10510

EXAMINER	
SMITH, COURTNEY L	

ART UNIT	PAPER NUMBER
2835	

MAIL DATE	DELIVERY MODE
12/10/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/562,528	FAN ET AL.	
	Examiner	Art Unit	
	Courtney L. Smith	2835	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 December 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *28 December 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *12/28/2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. **Claims 1-10, 14-16, 18, 20** rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

3. **Claims 1-10, 14-16, 18, 20** recites the limitation **"the substrate 110"** in respective claims. There is insufficient antecedent basis for this limitation in the claims.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. **Claim 1** rejected under 35 U.S.C. 102(b) as being anticipated by **(Mazzochette 7,095,053).**

Regarding Claim 1, Mazzochette discloses a device **(Fig. 6)** for thermal management of an LED **(10),** the device comprising: a heat sink **(51);** a substrate **(17)** overlying the

heat sink; a trace layer **(col. 6, lines 35-37)** overlying the substrate; and a via **(56)** extending through the substrate, wherein the via is in thermal communication with the trace layer and the heat sink to transfer to the heat sink at least a portion of any heat applied to the trace layer by the LED.

Regarding Claim 2, Mazzochette discloses a device **(Fig. 6)** of claim 1, further comprising: a bonding layer **(Col. 4, lines 7-11)** between the substrate and the via.

Regarding Claims 3-5, Mazzochette discloses a device **(Fig. 6)** of claim 2, wherein the bonding layer is a thermally conductive tape on a multi-layered substrate **(Col. 7, lines 4-10).**

Regarding Claim 6, Mazzochette discloses a device **(Fig. 6)** of claim 1, wherein the substrate is a printed circuit board **(Col. 2, lines 60-63).**

Regarding Claim 7, Mazzochette discloses a device **(Fig. 6)** of claim 1, wherein the substrate is a flexible substrate **(Col. 8, lines 58-59).**

Regarding Claim 12, Mazzochette discloses a device **(Fig. 6)** for thermal management of an LED **(10),** the device comprising: a heat sink **(51);** a trace layer **(Col. 3, lines 5-9);** and a flexible substrate **(Col. 8, lines 58-59)** in thermal communication with the trace

layer and the heat sink to transfer to the heat sink any heat applied to the trace layer by the LED.

Regarding Claim 13, Mazzochette discloses a device **(Fig. 6)** of claim 12, further comprising: a via **(56)** extending through the substrate, wherein the via is in thermal communication with the trace layer and the heat sink to enhance the transfer to the heat sink of any heat applied to the trace layer by the LED.

Claim Rejections - 35 USC § 103

3. **Claims 8-11, 14-20** rejected under 35 U.S.C. 103(a) as being unpatentable over **(Maxxochette 7,095,053)** as applied to claim 1 above, in view of **(Nakamura 7,054,159) Claims 8-11, Mazzochette** discloses a device **(Fig. 6)** of claim 1, **except** explicitly disclosing the via includes: a sidewall defining a channel through the substrate, the channel interfacing with the trace layer to thereby establish the thermal communication between the via, trace layer and heat sink. However, **Nakamura** discloses a sidewall **(copper foil--5a-fig. 2)** defining a channel **(5)** through the substrate **(2),** the channel interfacing with the trace layer **(2a, 2b)** to thereby establish the thermal communication between the via, trace layer, and heat sink **(4).** It would have been obvious to one having ordinary skill in the art at the time that the invention was made to provide the device of Mazzochette with the via of Nakamura in order to increase the

surface area of the via; wherein allowing for more effective heat transfer and bypassing the circuit board.

Regarding Claims 14-17, Mazzochette discloses a device **(Fig. 6)** of claim 1, **except** explicitly disclosing the via includes: a sidewall defining a channel through the substrate, the channel interfacing with the trace layer to thereby establish the thermal communication between the via, trace layer and heat sink. However, **Nakamura** discloses a sidewall **(copper foil--5a-fig. 2)** including defining a channel **(5)** through the substrate **(2),** the channel interfacing with the trace layer **(2a, 2b)** to thereby establish the thermal communication between the via, trace layer, and heat sink **(4).** It would have been obvious to one having ordinary skill in the art at the time that the invention was made to provide the device of Mazzochette with the via of Nakamura in order to increase the surface area of the via; wherein allowing for more effective heat transfer and bypassing the circuit board.

Regarding Claims 18-19, Mazzochette discloses a device **(Fig. 6)** for thermal management of an LED **(10),** the device comprising: a heat sink **(51);** a substrate **(17)** overlying the heat sink, a trace layer **(Col. 3, lines 5-9)** overlying the substrate; and a via **(56) except** explicitly disclosing the via includes: a sidewall defining a channel through the substrate, the channel interfacing with the trace layer to thereby establish the thermal communication between the via, trace layer and heat sink. However, **Nakamura** discloses a sidewall **(copper foil--5a-fig. 2)** including defining a channel **(5)**

through the substrate **(2),** the channel interfacing with the trace layer **(2a, 2b)** to thereby establish the thermal communication between the via, trace layer, and heat sink **(4).** It would have been obvious to one having ordinary skill in the art at the time that the invention was made to provide the device of Mazzochette with the via of Nakamura in order to increase the surface area of the via; wherein allowing for more effective heat transfer and bypassing the circuit board.

Regarding Claim 20, Mazzochette discloses a device **(Fig. 6)** of claim 18, further comprising: a bonding layer **(Col. 7, lines 4-10)** between the substrate and the via.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Courtney L. Smith whose telephone number is 571-272-9094. The examiner can normally be reached on Monday-Friday 7:30a-5p (1st Fri. off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jayprakash Gandhi can be reached on 571-272-3740. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Courtney L Smith C.S.
Examiner
Art Unit 2835

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BORIS CHERVINSKY
PRIMARY EXAMINER

12/6/7